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ABSTRACT

Existing data bearing on the relationship between residence and concern with environmental quality are rather ambiguous. A careful examination of all known studies of the residence-environmental concern relationship clarifies the existing ambiguity: studies which have focused on environmental problems at the state or national level seldom find a substantial relationship, while those which have focused on community or local environmental problems consistently report substantial relationships (with rural residents always ranking lower in environmental concern than urban residents). On the basis of this distinction between "local" and "distant" levels of reference, and a theoretical rationale concerning rural-urban differences in exposure to pollution and attitudes toward nature, the following hypotheses were developed: rural residents are less concerned with environmental problems than urban residents; these rural-urban differences are more pronounced when concern is assessed for environmental problems at the local community level compared to the state level; and rural farmers are less environmentally concerned than rural nonfarmers, and both are less concerned than urban residents. These hypotheses received strong support when tested with data from a 1970 statewide survey of public attitudes toward environmental problems in Oregon. The survey consisted of personal interviews with a statewide sample of 866 Oregon residents. (Author/NQ)

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Rural-Urban Residence and Concern with Environmental Quality: A Replication and Extension[1]

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ABSTRACT

Because it is generally assumed that rural and urban residents are exposed to different levels of environmental pollution and hold different attitudes toward the natural environment, most researchers have expected to find a relationship between residence and concern with environmental quality. However, existing data bearing on this relationship are rather ambiguous. Although some studies have found urban residents to have substantially higher levels of environmental concern than rural residents (as expected), other studies have reported only very slight differences and two Wisconsin surveys have found a slightly "negative" relationship. A careful examination of all known studies of the residence-environmental concern relationship clarifies the existing ambiguity: studies which have focused on environmental problems at the state or national level seldom find a substantial relationship, while those which have focused on community or local environmental problems consistently report substantial relationships (with rural residents always ranking lower in environmental concern than urban residents). On the basis of this distinction between "local" and "distant" levels of reference, and a theoretical rationale concerning rural-urban differences in exposure to pollution and attitudes toward nature, the following hypotheses are developed: 1) rural residents are less concerned with environmental problems than urban residents; 2) these rural-urban differences are more pronounced when concern is assessed for environmental problems at the local community level compared to the state level; and 3) rural farmers are less environmentally concerned than rural nonfarmers, and both are less concerned than urban residents. The hypotheses receive strong support when tested with data from a 1970 statewide survey.

Rural-Urban Residence and Concern with Environmental Quality: A Replication and Extension

In recent decades there has been considerable debate concerning the usefulness of the rural-urban variable in sociological analyses (see Lowe and Peek, 1974: Footnote 2). While in the first half of this century it seemed clear that there were significant differences between rural and urban residents on a variety of dimensions, such differences have been called into question in recent years (e.g., Taylor and Jones, 1964: Chap. 3). It is argued that factors such as standardized education, mass communication, increased travel and geographical mobility, and mechanization of agriculture have led to a convergence of attitudes and life-styles between rural and urban residents. Proponents of this view (e.g., van Es and Brown, 1974:386) argue that rural-urban differences are disappearing, and that residence has become a relatively unimportant predictor of attitudes and life-styles. However, other writers (e.g., Willits, et al., 1973:42) dispute the notion that rural-urban differences are declining, and still others (e.g., Lowe and Peek, 1974:410) argue that the rural-urban variable remains a relatively important predictor of attitudes. While the evidence supporting the competing perspectives seems mixed, very recent data suggest that there are <u>moderate</u> differences between rural and urban residents on attitudes toward a variety of issues, and that residence (while explaining only a modest proportion of variance in such attitudes) is as powerful a predictor as are income and occupational prestige (Glenn and Hill, 1977). Such evidence suggests to us that attention should still be given to the rural-urban variable.

In recent years several studies have examined the effects of rural-urban residence on concern with environmental quality. Such studies have generally found urban residents to be somewhat more concerned about environmental problems than rural residents (see Table 1 below). However, Buttel and Flinn (1974:63-65) recently called these findings into question. In two statewide surveys of Wisconsin residents conducted in 1968 and 1970, Buttel and Flinn found only negligible relationships between residence and environmental concern; and in 1968 rural residents were found to be slightly more environmentally concerned than urban residents. Buttel (1975:60) subsequently reported results from a 1972 Wisconsin survey, and again the residence-environmental concern relationship was negligible and "negative" (i.e., rural residents were slightly more concerned than urban residents).

Although Buttel and Flinn conclude that the rural-urban variable has no utility when applied to concern with environmental quality, they found rather different results when the rural residence aggregate was separated into its farm and nonfarm components. Rural farm residents were less likely to be concerned with environmental problems than were both rural nonfarm and urban residents. Thus, Buttel and Flinn (1974:65) suggest that: "To have validity, a designation of 'rural' unconcern for pollution problems has to specify it as a 'farm' category." In short, they believe a residential-occupational variable must be constructed in order to adequately assess rural-urban differences in environmental concern.

A Theoretical Rationale for Rural-Urban Differences in Environmental Concern

Buttel and Flinn's findings are rather surprising, for there appear to be good reasons for expecting at least modest differences in environmental concern among rural and urban residents. Specifically, we would expect to

find less concern for environmental problems among rural residents due to their exposure to generally lower levels of environmental pollution, and due to their greater tendency to hold utilitarian (as opposed to appreciative) attitudes toward the natural environment, compared to urban residents.

Although students of social problems are increasingly emphasizing the problematic link between objective conditions and public concern over "social problems" such as environmental quality, many analysts still posit a high degree of correspondence between public concern and objective conditions (see, e.g., Manis, 1976). In the case of environmental problems there would appear to be persuasive reasons for taking this position, as there is a fair amount of evidence that public concern with environmental problems is related to the actual levels of such problems (DeGroot, 1967; Dillman and Christenson, 1975; Dunlap and Heffernan, 1975).[2] For example, DeGroot (1967:680), in his summary of several studies of public awareness of air pollution, noted findings from one study in which "the rank-order correlation between the frequency with which respondents perceived neighborhood air pollution as a problem, and the actually measured level of suspended particulates in that neighborhood was . . . +0.80 . . . ." In another study a rank-order correlation of .85 was reported. Thus, DeGroot (1967: 680) concludes that, "the preponderate determinant [of pollution awareness and concern] is the actual level of pollution prevalent in the area of residence."

That urban residents are in fact typically exposed to more serious environmental problems than rural residents is documented in several sources. For example, the National Center for Air Pollution Control (1968:28) plotted a "pollution rating" against population size and found that, "air pollution

is strongly correlated with population [size] . . . ." Van Tassel (1973: 569) also found that air quality tends to improve as city size declines. Further evidence suggests that both water pollution and noise pollution are higher in urban places (Elgin, et al., 1974). Thus, insofar as actual pollution levels are positively associated with pollution concern, we would expect rural residents to be less concerned with environmental problems than urban residents.

It has also been argued that rural residents are more likely to hold utilitarian attitudes toward the natural environment, and that such attitudes are likely to make them less concerned with environmental quality than urban residents--who are more likely to hold appreciative attitudes (Hendee, et al., 1969:214; Harry, et al., 1969:248). Hendee (1969:337) attributes this divergence in attitudes to occupational differences, and Harry (1971:305-306) provides data indicating a significant relationship between "nature-exploitative" occupations and utilitarian attitudes toward natural resources.

Rural occupations are often nature-exploitive (or "extractive"), in that they involve the direct use of natural resources (Hines, et al., 1975: 35). Farming is one such occupation, but there are many others such as logging, mining, and trapping. People dependent on such occupations are assumed to believe "that nature is to be used, not just appreciated" (Hendee, 1969:337); and such attitudes are presumed to make them less concerned with environmental quality. Since urban occupations are usually far removed from the natural environment, and seen as less directly dependent on the use of natural resources, they are presumably less likely to lead to the development of utilitarian attitudes. This is supported by Kronus and

van Es (1976:22) who found that Illinois farmers (dependent on fertilizers which run off into the water supply) expressed significantly less concern about local pollution conditions than nearby urban men, as well as Salcedo, et al. (1971) who reported that Illinois farmers (dependent on pesticides which are harmful to the environment) were somewhat more favorable toward the pesticide industry than nearby urban residents.[3] Both studies suggest that the occupational requirements of rural residents, in this case farmers, are likely to lead to utilitarian attitudes toward the natural environment and lower levels of environmental concern.

Other rural residents, who are not directly engaged in nature-exploitive occupations, are also expected to hold utilitarian attitudes toward the natural environment, although not to the extent as those employed in nature-exploitive occupations. Through a shared "rural" culture, and shared beliefs, norms, and values, we would expect a utilitarian perspective to spread among rural residents. For example, a farmer would transmit his utilitarian attitudes toward the natural environment to his wife, children, and neighbors. The same would be true for those having other nature-exploitive occupations. Thus, we would expect most rural residents to hold utilitarian attitudes toward the natural environment, and therefore be less concerned with environmental quality than urban residents.

In sum, given differential exposure to environmental problems and differential attitudes toward the natural environment, we would expect rural and urban residents to differ in their concern with environmental quality. Specifically, we would expect to find that rural residents are less concerned with environmental quality than urban residents.

Review of Existing Evidence

Although there have been a very large number of studies of environmental attitudes (see Dunlap, 1975: Section II), a relatively small proportion have examined rural-urban differences. The primary reason for this general neglect is that most of these research efforts have been limited to single communities or other restricted samples (e.g., college students). However, there do exist a fair number of studies which have examined the relationship between rural-urban residence and environmental concern. With the exception of the Wisconsin surveys mentioned above, previous research has consistently found urban residents to be somewhat more concerned about environmental problems than rural residents, although the differences have often been quite small.

Existing studies which have contrasted rural-urban residence and concern with environmental quality are summarized in Table 1. The studies are categorized according to the level of reference employed in questions dealing with environmental problems. All twelve studies either explicitly or implicitly asked about environmental problems at the national or state levels (e.g., "how serious is pollution in this nation?"), or else at the community or local levels (e.g., "how serious is pollution in this area?"). The studies also differ in the type of sample used (national or state) and were conducted between the years of 1965 and 1972. In addition to the level of reference, type of sample, and date of survey, for each study we show the relationship found between residence and environmental concern. We give the percentage difference reported in the study and the measure of association (gamma) we computed when adequate information was provided to allow us to do so.

Table 1 about here

Two facts about Table 1 stand out. First, the 1968 and 1972 Wisconsin surveys are the only studies finding rural residents to be more concerned over environmental problems than urban residents. Thus, obvious questions arise concerning the generalizability of the Wisconsin findings. Second, and more important, it is clear that the level of reference of survey questions is crucial--rural-urban differences are much more pronounced when the level of reference is the community or local area. For example, the 1968 Opinion Research Corporation survey found that whereas 84 percent of the residents of urban places of a million or more felt that air pollution was a serious problem in their area, only 34 percent of the residents of communities of under 2500 felt likewise (percentage difference of 50 percent). In contrast, for questions with a national or state referent, the largest percentage difference found between rural and urban residents in concern with environmental problems was 15 percent.

Hypotheses

On the basis of foregoing, we hypothesize that:

1) Rural-urban residence will be related to environmental concern, with urban residents having higher levels of concern than rural residents.
2) Rural-urban residence will be more strongly related to environmental concern at the local community level than at the state level.
3) Rural farmers will rank lower in environmental concern than rural nonfarmers, but both will rank lower than urban residents.

The Study

The present study is based on data from a survey of public attitudes toward environmental problems in Oregon conducted by Louis Harris and Associates (1970a). The survey consisted of personal interviews given to a statewide sample of 866 Oregon residents in January 1970, and the sample was found to be representative of the state population in terms of demographic characteristics.[4] The Oregon data are especially appropriate for our analysis for several reasons. First, the survey was conducted during the same time period as most of the studies listed in Table 1. Second, there is a substantial correlation between actual pollution levels and rural-urban residence in Oregon, with urban residents being exposed to more serious pollution levels than rural residents (Dunlap and Heffernan, 1975).[4a] Finally, the survey included questions tapping pollution concern at both the state and community levels, thus allowing us to examine the residence-pollution concern relationship for both local and more distant pollution.

Pollution concern,[5] the dependent variable, was measured by eight questions--four pertaining to pollution problems at the local community level and four at the state level (Harris, 1970a). The first two questions were open-ended, and were asked before interviewers made any mention of environmental problems. Respondents were first asked: "What do you feel are the two or three most serious problems facing this community that something will have to be done about over the next few years?" and then asked: "Now, thinking about the whole state, what do you feel are the two or three most serious problems facing Oregon that something will have to be done about over the next few years?" Respondents were classified as concerned

about pollution if they volunteered "pollution," "air pollution," or "water pollution" in response to these questions.

The remaining six questions were forced-choice items. Immediately after responding to the above two open-ended questions, respondents were presented a list of eleven potential problems (including "reducing air and water pollution") facing the state and their local community, and asked to indicate, "Which two or three on this list do you personally feel are the most serious?"--first for the state, and then for their community. Respondents selecting "reducing air and water pollution" were categorized as concerned with pollution. Respondents were next given two forced-choice questions to tap their degree of concern with air pollution. They were first asked: "Thinking about the whole state again, how serious do you feel the problem of air pollution is in Oregon--do you feel it is a very serious problem, a somewhat serious problem, only a small problem, or no problem at all in Oregon?" and then they were asked: "And how about in your own community--do you feel air pollution is a very serious problem, a somewhat serious problem, only a small problem, or no problem at all in your own community?" Finally, identical questions were asked concerning water pollution at both the state and community levels. For these final four questions respondents were categorized according to their degree of concern over air pollution or water pollution.

Our primary independent variable, residence, was coded by the interviewers. Respondents were placed into one of the following categories: Urban (central cities with a population of 50,000 or more); Urban fringe (suburban areas as defined in the 1960 census); Small town (population centers of 2500 to 49,999); and Rural (population centers of 2499 or less; and townships).[6] Our other independent variable, farm-nonfarm, was obtained

from a question on occupation. Respondents indicating that the head of the household was a "farmer, farm manager or farm laborer" were categorized into the "farm" classification.

Results

Before examining the relationships between residence and pollution concern (shown in Table 2), we will briefly discuss the marginals for the eight questions in order to provide an indication of the overall levels of concern for environmental pollution among Oregon residents. The results indicate that Oregon's reputation for environmental concern is well deserved, as over half of the sample indicated a concern with pollution on three of the four items measuring concern at the state level. Specifically, 53 percent volunteered pollution as a serious problem facing the state to the open-ended question, 54 percent selected "reducing air and water pollution" from the list of problems facing the state, and 53 percent felt water pollution was "a very serious problem" in response to the forced-choice question. The response to the forced-choice question on air pollution differed somewhat, as 41 percent felt air pollution was "a very serious problem" facing the state. In contrast, the responses to questions dealing with pollution at the local community level were consistently lower, as 39 percent volunteered pollution as a serious problem facing their community, 33 percent selected "reducing air and water pollution" from the list of problems facing their community, 34 percent felt water pollution was "a very serious problem" in their community, and only 24 percent felt likewise about air pollution in their community. Thus, for every pair of questions a considerably smaller proportion of respondents viewed environmental pollution as a serious prob-

lem in their community compared to the state as a whole, a pattern consistent with previous research (DeGroot, 1967; Murch, 1971).[7]

We now turn to an examination of the data relevant to our hypotheses, and the data needed to test the first two hypotheses are presented in Table 2. The table shows the percentage giving a response indicating concern with pollution for each residential category, as well as a measure of association (gamma) for each residence-pollution concern relationship. In order to save space, we show only the percent categorized as concerned with pollution for the first two questions, and only the percent who indicated air (or water) pollution was "a very serious problem" for the latter two questions.[8]

The first hypothesis, that urban residents will have higher levels of pollution concern than rural residents, is consistently supported by the data, although the degree of support differs depending on the level of reference used in the questions. For the questions focusing on pollution at the state level, the associations (while always in the predicted direction) are relatively weak, ranging from .04 to .23. In contrast, for the questions concerning pollution at the community level, the associations tend to be more pronounced, ranging from .24 to .69. Nonetheless, all eight relationships support the hypothesis that residence is related to pollution concern, although concern does not increase monotonically from rural to urban residence. In general, rural and small town residents are quite similar in their levels of pollution concern, and both differ considerably (especially concerning pollution at the community level) from residents of urban fringe and urban areas--who are likewise similar in pollution concern.

Table 2 about here

While the first hypothesis is supported, it must be emphasized that it receives substantial support only for pollution problems at the community level. This finding is consistent with the results of the studies summarized earlier in Table 1, in which the percentage differences between rural and urban residents in terms of environmental concern were much higher for the community and local levels compared to the state and national levels. In addition, the forced-choice question on air pollution is the question most strongly associated with residence, at both the state and community levels. The high associations obtained with this item are consistent with other studies (see Table 1), and probably stem from the fact that air pollution is generally the most serious environmental problem in urban areas while not constituting a serious problem in most rural areas. We would therefore expect questions focusing specifically on air pollution to differentiate best between rural and urban residents, and such findings support our contention that pollution concern is influenced by actual levels of pollution.

By now it is obvious that there is also considerable support for the second hypothesis, which predicted that the residence-pollution concern relationships would be stronger at the community than the state level. This pattern holds for every pair of questions, as the gammas in Table 2 increase from .04 to .24, .19 to .33, .23 to .69 and .06 to .42 when we move from the state to the community level (an average increase of .29).

On the basis of the foregoing results we conclude that it is crucial to differentiate between concern for environmental problems at the state (or national) level and at the community (or local) level. This distinction between "local" and "distant" problems clarifies the results presented in

Table 1, and sheds light on Buttel and Flinn's failure to find significant residence-pollution concern relationships in their Wisconsin studies, for they focused on environmental pollution at the state and (in 1972) national levels (Buttel and Flinn, 1974:59-60; Buttel, 1975:58). Further, the results (both ours and those summarized in Table 1) suggest that the question used to measure environmental concern makes a difference, as forced-choice questions--especially concerning air pollution--differentiate best between rural and urban residents while open-ended questions on "serious problems" facing the community, state, nation, etc., distinguish least well. Thus, Buttel and Flinn's use of open-ended questions to measure pollution concern may have also contributed to their finding essentially no relationship between residence and pollution concern.

The third hypothesis predicted that rural farmers would rank lower in pollution concern than rural nonfarmers, and that both would rank lower than urban residents. The relevant data are reported in Table 3, which shows the percentage of respondents concerned over pollution among rural farm, rural nonfarm, and urban residents (the latter including only "urban fringe" and "urban area" residents).[9] The results provide strong support for the hypothesis, although the rural farm versus rural nonfarm comparisons should be viewed with caution due to the relatively small number (25) of farmers in the sample. With one exception (where their responses are identical) farmers indicate lower levels of pollution concern than other rural residents. Likewise, in all eight instances the rural nonfarm category exhibits lower levels of pollution concern than urban residents, and the differences are especially large at the community level--as we would

expect.[10] In sum, the pattern predicted by the third hypothesis is obtained in the results.

Table 3 about here

These results lend support to the idea that those dependent upon the direct utilization of natural resources--such as farmers--are especially unlikely to be concerned with environmental pollution. Of course, in a sample of Oregonians it is likely that many rural area and small town residents hold nature-exploitive occupations other than farming, particularly logging and, to a lesser degree, mining. Unfortunately, the Harris data do not provide sufficient information on occupation to enable us to reasonably identify such individuals, making it impossible to compare pollution concern among rural residents engaged in nature-exploitive occupations with concern among other rural residents. Consequently, we tentatively conclude that the results support both aspects of our theoretical rationale--namely, rural residents are less concerned over environmental pollution because they are more likely (presumably due to their occupations) to hold utilitarian attitudes toward the environment and because they are exposed to lower levels of pollution compared to urban residents. This conclusion is, at least obliquely, supported by our next set of data.

An obvious question to consider is whether the relationships reported above are affected by other variables. To examine this question we controlled on three variables which have previously been found to be associated with both environmental concern and residence: education, income, and age (Buttel and Flinn, 1974; Dillman and Christenson, 1972; Hines, et al., 1975). We computed partial gamas (Davis, 1967) in order to examine the

relationship between residence and pollution concern while controlling for these test variables.[11] A summary of the results is presented in Table 4, and these results indicate that controlling for the test variables has a negligible effect on the original relationships.[12] Thus, the various partial gammas vary only slightly from the eight zero-order gammas; the largest difference is only .05.

Table 4 about here

While researchers are often disappointed if they cannot "interpret" a relationship by showing "how" or "why" the independent variable influences a dependent variable, this is not the case in the present situation.[13] Although it would have been interesting to learn that rural and urban residents differ in pollution concern because of differences in education, income, or age, the failure of any of these control variables to influence the original relationships provides at least indirect support for our theoretical rationale. That is, since the differential levels of pollution concern between rural and urban residents cannot be accounted for by age, income, or educational differences, the possibility that they stem from differential attitudes toward nature and/or differential levels of exposure to actual pollution becomes somewhat more tenable.

Conclusion

We have attempted to clarify the relationship between residence and environmental concern in this paper. Previous findings have been rather ambiguous, with several studies reporting extremely weak relationships and two Wisconsin surveys finding--contrary to expectation--that rural residents

were slightly more concerned with pollution than urban residents. However, due to differential exposure to pollution and differential attitudes toward nature (stemming from occupational differences) between rural and urban residents, we predicted that residence would be related to pollution concern, with urban residents more concerned than rural residents. Data from a 1970 statewide survey provide considerable support for our prediction, and also allow us to clarify the ambiguous results of other studies. Specifically, as predicted, the level of reference at which environmental problems are examined is crucial--pollution concern and residence are highly associated at the community level but only slightly associated at the state level. Also, the type of question used to measure environmental concern appears to have an effect, with questions focusing specifically on air pollution differentiating most strongly between rural and urban residents. Further, rural farmers were found to be the least concerned with environmental pollution, suggesting that the construction of a joint residential-occupational variable may be useful in explaining environmental concern. It is hoped that future studies will be able to more fully operationalize the "nature exploitative versus non-exploitative" occupation variable, in order to more adequately separate the effects of utilitarian attitudes from exposure to actual levels of pollution (to the extent that the latter are strongly correlated with rural-urban residence) in influencing environmental concern.[14]

While more research on the residence-environmental concern relationship is clearly called for, we believe our results (as well as the results summarized in Table 1) suggest that rural-urban residence is an important variable to consider when examining environmental concern. This leads us to join with those (e.g., Lowe and Peek, 1974) who argue that the rural-urban variable remains a relatively important variable in sociological analysis.

Footnotes

2. It should be noted that some writers have questioned the association between objective environmental conditions and public concern over environmental problems. Both Albrecht and Mauss (1975:556-573) and Munton and Brady (1970:16), for example, question such a relationship and call particular attention to the fact that the recent rise in environmental concern was not accompanied by a comparable rise in actual pollution levels. While we realize that environmental concern is influenced by many variables besides objective environmental conditions (e.g., exposure to the media), we believe the preponderance of evidence suggests that environmental concern is substantially related to exposure to environmental problems (see studies cited in the text).

3. Salcedo, et al. (1971:560) argued that the relationship they observed was "spurious," after finding that the difference between farmers and urban residents in attitudes toward the pesticide industry was affected somewhat by controlling for presence of children under 15 in the household, level of education of the respondent, and yearly amount spent on pesticides. However, since they (correctly we believe) regarded these test variables as "intervening" variables, controlling for them could not have made the original relationship spurious, since only "antecedent" test variables can "explain away" a relationship (see, e.g., Rosenberg, 1968: Chaps. 2 and 3). Examination of their data suggests that they "specified" the original relationship, in that it tended to disappear in one partial while becoming stronger in the other partial when presence of a child, amount spent on pesticides, and level of education were controlled (although only slightly in the case of education) (see Rosenberg, 1968: Chap. 6 on specification).

4. A similar survey was conducted in Washington (Harris, 1970b). However, the sample was very unrepresentative, and considerable weighting was required to make it representive of the state population. Unfortunately, insufficient information was supplied to enable us to make the necessary weightings, and thus we were unable to use the Washington data.

4a - see p. 20a

5. We are purposely limiting our attention to concern with "pollution" for several reasons. First, of the eight questions we will use, six (all forced-choice) focus specifically on air and/or water pollution. Further, we decided to look only at "pollution" responses to the two open-ended questions in order to follow Buttel and Flinn's (1974:59-60) methods as closely as possible and because very few respondents mentioned environmental problems other than pollution in response to these questions (e.g., three percent mentioned "litter" as a community problem and six percent mentioned it as a state problem--Harris, 1970a:13, 17). These results support impressionistic evidence suggesting that at the time of the survey (1970) concern over air and water pollution were the primary determinants of "environmental concern" among the public.

6. For the bulk of their analyses Buttel and Flinn (1970:64-65) dichotomized residence into "rural vs. urban" (the latter including communities of 2500 or more). We, however, prefer the use of the four categories listed above because it preserves a greater amount of information. For example, as will be seen below, residents of rural areas and small towns are similar in their level of pollution concern, as are residents of urban fringe and urban areas.

7. Murch (1971) suggests two reasons for this pattern. First, the news media are more likely to focus on environmental pollution at the state, national, or global level, rather than the local level. Second, to admit that pollution (often a health hazard) is a serious problem in one's own community is likely to produce dissonance, for people do not like to acknowledge that their immediate environment has serious defects.

8. The first two questions provide dichotomous responses concerning pollution concern, and thus gammas were computed on two by four tables. The last two questions yield four levels of pollution concern, and thus gammas were computed on four by four tables.

9. Unlike Buttel and Flinn (1974), we are not including residents of "small towns" in the urban category for two reasons. First, as noted above, the data in Table 2 indicate that small town residents are quite similar to rural residents in terms of pollution concern, and both differ considerably from "urban fringe" and "urban area" residents. Second, and most importantly, the loose definition of small towns (2500 and over) as "urban" (even though used in the census) is inconsistent with our theoretical rationale. We expect to find higher levels of environmental concern among urban residents because they are more likely to be exposed to serious pollution problems, and because they are less likely to hold utilitarian attitudes toward the natural environment (due to occupational differences) than rural residents. Clearly, residents of small towns are only slightly more likely than rural residents to be exposed to serious levels of pollution, and they may be nearly as likely as rural residents to be engaged in nature-exploitive occupations leading to utilitarian attitudes (especially where there are numerous such occupations besides farming, such as logging and mining). The results in Table 2 are consistent with this argument. Finally, the decision to delete residents of "small towns" rather than classify them as "urban" is not unique to this study (see, e.g., Lowe and Peek, 1974:399).

10. We must acknowledge that our finding a substantial difference between ~~urban~~ rural nonfarm residents and urban residents--in contrast to Buttel and Flinn (1974:64)--is partially due to our more restrictive definition of "urban." When "small town" residents are included along with "urban fringe" and "urban area" residents, differences between the resultant "urban" category

and the rural nonfarm category become negligible for pollution at the state level (analogous to the results obtained by Buttel and Flinn). Thus, the percentages of such urban residents classified as concerned with pollution at the state level are, reading downward from the first to fourth question listed in Table 3, 53.2, 56.1, 44.0 and 52.8. However, at the community level a substantial difference remains between rural nonfarm and urban residents, even when this broader definition of urban is used. Reading downward, the relevant percentages are 42.8, 37.5, 33.3 and 40.9.

11. When controlling on the test variables, we dichotomized them as follows: education (high school graduate or less vs. greater than high school education), income (less than $10,000 per year vs. $10,000 or more per year), and age (under 35 vs. 35 and over). Finer categories were not used in order to maintain a sufficient number of cases in each cell in the conditional relationships to provide reliable results. Also, we controlled for the test variables individually rather than simultaneously for the same reason. Finally, because of the small number of farmers in the sample we could not examine the rural farm-rural nonfarm and pollution concern relationships while controlling for the test variables.

12. Although the partial relationships reveal a few instances of moderate statistical interaction, the patterns are not consistent across the various indicators of pollution concern. Thus, there is no evidence that any of the test variables "specify" the relationship between residence and pollution concern (see Rosenberg, 1968: Chap. 6).

13. We tend to regard these variables as intervening rather than antecedent variables, although their failure to affect the residence-environmental concern relationship makes the question of causal order a mute issue.

14. An ideal study would not only operationalize the exploitive - nonexploitive variable, but would also attempt to directly measure utilitarian attitudes.

4. a. For example, when 1968 emission levels of eight air pollutants (Department of Environmental Quality, 1969:9) and 1970 "percent urban population" are correlated by county, a multiple correlation coefficient of .68 is obtained (organic gases and nitrous oxide both produce zero-order correlation coefficients of .61). We suspect that a more direct measure of rural-urban residence would produce still higher correlations with air pollution levels. Further, while comparable data on water pollution do not exist, officials in Oregon's Department of Environmental Quality assured the second author that there is a "substantial" correlation between rural-urban residence and water pollution levels, with urban residents generally exposed to more serious water pollution.

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Table 1. Results of Studies of the Relationship between Rural-Urban Residence and Environmental Concern by Level of Reference[a]

Sample and Year	Percentage Difference[b]	Gamma[c]
National or State Level		
National--1969[f]	+ 5	+.07[d]
National--1970[g]	+ 1	+.04
National--1971[h]	+15	+.11[d]
Wisconsin--1968[i]	- 5	-.18
Wisconsin--1970[i]	+ 2	+.04
Wisconsin--1972[j]	- 4	-.15
Community or Local Level		
National--1965[k]		
Air Pollution	+35	e
Water Pollution	+15	e
National--1967[k]		
Air Pollution	+45	e
Water Pollution	+24	e
National--1968[k]		
Air Pollution	+50	e
Water Pollution	+26	e
National--1970[l]	+10	+.12
National--1971[m]		
Air Pollution	+43	+.73
Water Pollution	+32	+.60
Washington--1970[n]		
Air Pollution	+27	+.54
Water Pollution	+12	+.29

[a]The "national or state level" means that respondents were asked about their concern over environmental/pollution problems at the national or state level, while "community or local level" means that respondents were asked about their concern over environmental/pollution problems at the community or local level.

[b]A positive percentage difference means that urban residents expressed a higher degree of concern than did rural residents.

[c]A positive gamma reflects a positive relationship between urban residence and concern over environmental/pollution problems.

[d]The "no opinion" category was deleted in the computation of gamma.

Table 1. Continued

[e]Gammas could not be calculated due to lack of information on the N's for residential categories.

[f]National Wildlife Federation (1969)

[g]University of Michigan National Election Survey reported in Hornback (1975).

[h]National Wildlife Federation (1972).

[i]Buttel and Flinn (1974:64); Buttel (1975:60).

[j]Buttel (1975:60).

[k]Opinion Research Corporation surveys reported in Munton and Brady (1970:27).

[l]Public Broadcasting Environment Center (1970).

[m]Harris (1975).

[n]Dillman and Christenson (1972:249).

Table 2. Associations between Pollution Concern (at State and Community Levels, Respectively) and Residence

Pollution Items	State Level					Community Level				
	Rural Area	Small Town	Urban Fringe	Urban Area	Gamma	Rural Area	Small Town	Urban Fringe	Urban Area	Gamma
Volunteered Pollution as Serious Problem in Open-Ended Question	52.9% (312)	45.3% (212)	67.7% (130)	52.4% (212)	.04	31.1% (312)	31.6% (212)	53.8% (130)	47.2% (212)	.24
Selected Air and Water Pollution from List of Serious Problems	50.6% (312)	43.4% (212)	60.8% (130)	66.0% (212)	.19	26.0% (312)	18.9% (212)	51.5% (130)	47.6% (212)	.33
Air Pollution Noted as Very Serious in Forced-Choice Question	35.7% (300)	31.8% (201)	45.0% (129)	55.0% (211)	.23	8.4% (309)	8.7% (206)	36.2% (130)	55.5% (211)	.69
Water Pollution Noted as Very Serious in Forced-Choice Question	54.2% (301)	45.5% (191)	52.3% (128)	59.7% (206)	.06	22.2% (306)	21.8% (193)	51.6% (126)	52.5% (204)	.42

Table 3. Pollution Concern (at State and Community Levels, Respectively) by Rural Farm, Rural Nonfarm, and Urban Residence

Pollution Items	State Level			Community Level		
	Rural Farm	Rural Nonfarm	Urban*	Rural Farm	Rural Nonfarm	Urban*
Volunteered Pollution as Serious Problem in Open-Ended Question	32.0% (25)	54.7% (287)	58.2% (342)	24.0% (25)	31.7% (287)	49.7% (342)
Selected Air and Water Pollution from List of Serious Problems	28.0% (25)	52.6% (287)	64.0% (342)	4.0% (25)	27.9% (287)	49.1% (342)
Air Pollution Noted as Very Serious in Forced-Choice Question	24.0% (25)	36.7% (275)	51.2% (340)	4.0% (25)	8.8% (284)	48.1% (341)
Water Pollution Noted as Very Serious in Forced-Choice Question	54.2% (24)	54.2% (277)	56.9% (334)	4.0% (25)	23.8% (281)	52.1% (330)

*Includes only "Urban Area" and "Urban Fringe" residents, as "Small Town" residents are deleted.

Table 4. Comparison of Zero Order Gammas and Partial Gammas, Controlling for Education, Income and Age Respectively

Pollution Items	State Level				Community Level			
	Zero Order Gamma	Partial (Education)	Partial (Income)	Partial (Age)	Zero Order Gamma	Partial (Education)	Partial (Income)	Partial (Age)
Volunteered Pollution as Serious Problem in Open-Ended Question	.042	.023	.018	.019	.239	.207	.240	.204
Selected Air and Water Pollution from List of Serious Problems	.190	.160	.177	.201	.325	.299	.306	.321
Air Pollution Noted as Very Serious in Forced-Choice Question	.233	.236	.276	.227	.687	.677	.682	.687
Water Pollution Noted as Very Serious in Forced-Choice Question	.056	.055	.063	.061	.422	.419	.445	.427